April 4, 1949.

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Dear Mike:

I'm looking forward to seeing you at Cincinnati, but there are a couple of things that might be taken up first.

A. If you still have in mind spending some time here, can you give me any notion of when and how long it would be? I want to be able to reserve some lab space for you, and not have to sandwich you between too many students. Sometime this summer or before the Fall semester (Sept. 19) would be preferred, but we can probably make any arrangement that would suit your convenience.

B. I'd like to do some quantitative differential sugar determinations using T. monosa. Can you send me a slant, possibly with some directions if needed? Thanks.

C. Not much new on galactosidase; I've been very busy with heterozygotes in E. coli — have a manuscript in press for the April PNAS. Also, K-12 is lysogenic, and I've had to spend some time on that bypath also. If I haven't already mentioned this to you, one of the most startling results is that Lac_1- although lactose-"negative" when grown on lactose, produces considerable galactosidase, and washed cells ferment lactose vigorously, when grown on butyl galactoside. This seems to dissociate the specificity of enzyme adaptation from the action of the enzyme once formed. Conversely, lactobionate, which is not utilized at all by the wild type cells, nor shows any appreciable affinity for galactosidase, is very potent in eliciting the formation of the enzyme.

D. Galactosidase, or rather lactase in the present application, was, I hoped, going to be a cleancut story with no complications like those in amylomaltase. That galactose-negative cells accumulated hexose during lactose utilization was rather encouraging. But lately, I've noticed that a suppressor-mutant combination, very much like M-252, i.e., Lac/Glu- from Lac-Glu- from Lac/Glu/?

wild type, ferments lactose about 4times as rapidly as galactose, and still more effectively than glucose.,Cells grown on lactose use butyl-galactoside as quickly as lactose, so that we are probably dealing with a special mechanism for galactoside transfer (to phosphate?, or even to polysaccharide ???). I haven't checked yet for glucose accumulation; that's one of the purposes that I want T. monosa for. Like W-327, (in respect to the second glucose) dried cells do not ferment lactose (although they split galactoside), while dried cells of K-12, of course, do ferment lactose as they do hexose. This is based on just one experiment.

In all of this, I expect that we're dealing with something very much analagous to Green's cyclophorase. His unextracted preparations completely oxidise pyruvate, and can apparently transfer HE phosphate during the oxidation; the extracted enzymes put together perform most of the Krebs cycle steps, but with neither a dependence on nor a use for phosphate.

For Cincinnati, I don't intend to say anything along these lines, which you are more competent to discuss. Rather, I hope to expound the genetic analysis and the adaptive properties of lactase.

See you then, best regards,

Joshua Lederberg